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PA Narrative Report

Keystone Sanitation Landfill Site
Adams County, Pennsylvania

01 November 1996

EPA10000

TDO No. 9605-23
Contract No. 68-S5-3002

AR320197

T R I P R E P O R T

**Keystone Sanitation Landfill NPL Site
Hanover Township, Adams County, Pennsylvania**

**TDD No. 9605-23
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1.0 INTRODUCTION

On 17 May 1996, the Roy F. Weston, Inc. (WESTON), Site Assessment Technical Assistance (SATA) Team was directed by the U.S. Environmental Protection Agency (EPA) Remedial Project Manager (RPM) Christopher Corbett to conduct a fish tissue sampling event at the Keystone Sanitation Landfill NPL Site located in Hanover Township, Adams County, Pennsylvania.

2.0 BACKGROUND

2.1 Site Description

The Site is an inactive landfill owned by the Keystone Sanitation Company and is located on Clouser Road, Hanover Township, Adams County, Pennsylvania (see Figure 1-Site Location Map). The landfill operated from 1966 to 1990 and was permitted by the Pennsylvania Department of Environmental Protection (PADEP) to receive household and municipal wastes, and certain types of industrial and construction debris. The landfill was constructed without a liner (SATA, 1995).

The Keystone Sanitation Landfill Site was placed on the National Priorities List (NPL) in July 1987. EPA issued a Record of Decision (ROD) on 30 September 1990 (SATA, 1995). The ROD established the Site remedial design that is to be completed in two phases, Operable Unit #1 (OU1) and Operable Unit #2 (OU2). OU1 included the capping of the landfill area gas collection system, and the installation of a pump and treat system. Currently, the OU1 R.D. is 90% complete. OU2 required an off-site contaminant migration investigation.

Continuing operations at OU2, the EPA Region III Alternative Remedial Contracts Strategy (ARCS) contractor, Halliburton NUS Corporation, sampled monitoring and residential wells in January and in the fall of 1995. Elevated lead concentrations were detected in three of the residential wells sampled.

3.0 SITE ACTIVITIES

On 4 and 5 June 1996, an EPA sampling activity, led by RPM Christopher Corbett, was initiated to collect fish tissue samples and information to supplement an Ecological Risk Assessment performed by Halliburton NUS. The following representatives were present on site: EPA RPM Christopher Corbett; EPA Public Relations representative, Larry Brown; Maryland Department of Environment (MDE), Michelle Mosco-Lascuola and James Gravette; SATA members [REDACTED], [REDACTED], and [REDACTED]; WESTON employee, [REDACTED]; and Baltimore Sun reporter, Donna Engels.

3.1 Meteorological Conditions

The ambient meteorological conditions during the 4 and 5 June 1996 sampling event are summarized below:

Table 1
Meteorological Conditions

Temperature	75° F
Winds	15 mph
Conditions	sunny and clear
Humidity	40%

3.3 Sampling Activities

SATA collected 45 fish tissue samples during the 4 and 5 June 1996 sampling event. Nineteen of the 45 samples were analyzed as whole fish samples and 26 of the 45 samples were analyzed as fillet samples for mercury. The Llaing, I, and Bloom, N, Determination of Total Mercury by Single Stage Gold Amalgamation with Cold Vapor Atomic Spectrometric Detection provided in the *Journal of Analytical Atomic Spectrometry*, 1993, was used. Sampling locations are identified in Figure 2-Sampling Location Map. All samples were handled and packaged in accordance with the sampling plan and were shipped via Federal Express to [REDACTED] in [REDACTED] for analysis.

3.3.1 [REDACTED] Pond

On 4 June 1996, SATA members sampled [REDACTED] using a seine and an electroshocker to obtain composite samples of a predator species and a bottom-dwelling species. The objective, as stated in the sampling plan, was to analyze fish tissue samples to investigate the possibility of mercury bioaccumulation in the fish. Due to the absence of a bottom-dwelling fish species, *Lepomis macrochirus* (bluegill) and *Micropterus salmoides* (largemouth bass), the only two species of fishes in the pond, were retrieved for the samples. Since bass are consumed by humans and bass prey on bluegill, mercury bioaccumulation can be observed. Therefore, the absence of the bottom-dwelling species will not affect the objective as stated in the sampling plan. A total of 15 bluegills and 8 bass were collected. The following table represents each of the four composite samples collected at [REDACTED]:

Table 2
Composite Samples Collected from [REDACTED]

Sample Identification							
BrP1(W)-Bluegill		BrP2(F)-Bluegill		BrP3(F)-Bass		BrP4(W)-Bass	
Length	Weight	Length	Weight	Length	Weight	Length	Weight
191 mm	139.1 g	190 mm	117.4 g	415 mm	650.0 g	245 mm	162.5 g
170 mm	94.1 g	204 mm	138.0 g	307 mm	311.7 g	240 mm	153.9 g
176 mm	104.7 g	197 mm	134.1 g	230 mm	134.7 g	242 mm	145.3 g
181 mm	98.9 g	188 mm	127.5 g	433 mm	780.0 g	252 mm	173.3 g
196 mm	124.1 g	192 mm	143.2 g	---	---	---	---
---	---	195 mm	124.8 g	---	---	---	---
---	---	201 mm	126.6 g	---	---	---	---
---	---	192 mm	123.9 g	---	---	---	---
---	---	194 mm	126.0 g	---	---	---	---
---	---	192 mm	112.1 g	---	---	---	---

W Whole Fish Sample
F Fillet Fish Sample
mm millimeters
g grams

Each fish had its spines clipped and were individually wrapped in aluminum foil. Samples were placed in water-tight plastic bags and stored on dry ice. Observations made by SATA at the [REDACTED] are as follows:

- According to the topographic map, the pond is a tributary to Pine Creek.
- The pond is approximately 10% shaded.
- The watershed is 80% open and 100% hills.
- The area surrounding the pond consists of wood and grass.
- The bank consists of mud and grass.
- The pond is approximately 110 feet by 150 feet.
- The pond is green and full flow.
- There are no odors, oil sheens, or deposits.
- The bottom of the pond is 100% clay.
- Carex and Cyperex plants line the shore in addition to *Gomphid dae* (dragon flies).
- There is an algae bloom on the surface of the pond.
- Dissolved oxygen readings at the surface were 11.0 mg/L and at the bottom were 10.8 mg/L.
- The water temperature was 23°C, pH was 8.2, and the conductivity was 190µS.
- The center of the pond was 7 feet deep.

The numbers of each species of fish caught by the seine are listed in Table 3. The fish were not diseased or deformed and no parasites were located on their bodies. SATA could not obtain complete samples, both fillet and whole, for the bass, using the seine. Five bass were collected using the electroshocking sampling technique. Electroshocking entailed the use of pulsating electric currents to stun the fish long enough to collect them with a long handle dip net.

Table 3
Species Caught at [REDACTED]

First Seine		Second Seine		Third Seine		Fourth Seine		Fifth Seine	
Bass	1	Bass	1	Bass	0	Bass	0	Bass	1
Bluegill	53	Bluegill	75	Bluegill	15	Bluegill	69	Bluegill	200

3.3.2 [REDACTED] Pond

On 5 June 1996, SATA members sampled [REDACTED] using a seine to collect composite samples of bass and bluegill. Due to the absence of a bottom-dwelling species in [REDACTED] the bluegill and bass were the sample species. The objective for the sampling event was not compromised using the same reasoning as previously noted in subsection 3.3.1. A total of 12 bluegills and 10 bass were collected. The following table represents each of the four composite samples collected at [REDACTED]

Table 4
Composite Samples Collected from [REDACTED]

Sample Identification							
RuP1(F)-Bluegill		RuP2(W)-Bluegill		RuP3(F)-Bass		RuP4(W)-Bass	
Length	Weight	Length	Weight	Length	Weight	Length	Weight
228 mm	251.3 g	220 mm	211.5 g	292 mm	293.1 g	244 mm	162.8 g
215 mm	190.5 g	214 mm	214.5 g	265 mm	214.9 g	247 mm	169.9 g
226 mm	215.4 g	219 mm	201.8 g	273 mm	241.0 g	220 mm	128.8 g
219 mm	225.9 g	216 mm	201.7 g	262 mm	210.5 g	200 mm	101.0 g
217 mm	209.6 g	215 mm	236.0 g	247 mm	176.5 g	230 mm	134.7 g
242 mm	275.9 g	---	---	---	---	---	---
223 mm	232.1 g	---	---	---	---	---	---

W Whole Fish Sample
F Fillet Fish Sample
mm millimeters
g grams

Each fish had its spines clipped and were individually wrapped in aluminum foil. Samples were placed in water-tight plastic bags and stored on dry ice. Observations made by SATA at the [REDACTED] are as follows:

- According to the topographic map, the pond is a tributary to Pine Creek.
- The pond is approximately 350 feet by 250 feet with green water.
- The bank of the pond is 30% shaded and is mostly mud and grass.
- The watershed is 80% open, and the area around the pond is 100% hills.
- The bottom of the pond is 50% clay and 50% silt.
- There are no odors, deposits, or oil sheens.
- The flood plain is 50% wood and 50% grass.
- The center of the pond is approximately 4.8 feet deep.
- Dissolved oxygen at the surface was 13.4 mg/L and at the bottom 14 mg/L.
- The water temperature was 22°C, pH was 7.1, and the conductivity was 150 µS.
- The bottom of the pond was covered with Potamegetan (pond weed).
- Sagittaria and Carex plants were on the bank of the pond, in addition to dragon flies and damsel flies..
- Snails, bull frogs, and green frogs were found in the pond.

The number of each species of fish caught by the seine are listed in Table 5. One bluegill had a portion of one fin missing and some parasites, but the rest of the fish caught in the seine were not deformed or diseased.

Table 5
Species Caught at [REDACTED] Pond

First seine		Second seine		Third seine		Fourth seine	
Bass	4	Bass	6	Bass	24	Bass	5
Bluegill	45	Bluegill	71	Bluegill	152	Bluegill	68

4.0 DATA SUMMARY

A summary of the results is listed in Table 6.

Table 6
Summary of Results

Sample Identifier	BTAG* Value (mg/kg)	RBC** Value (mg/kg)	FDA*** Action Level (mg/kg)	Concentration of mercury in sample (mg/kg)		Sample Type	Species
				Dry weight	Wet weight		
BrP1(W)	0.1	0.41	1.0	0.175	0.044	Whole	Bluegill
BrP2(F)	0.1	0.41	1.0	0.251	0.059	Fillet	Bluegill
BrP3(F)	0.1	0.41	1.0	1.370	0.285	Fillet	Bass
BrP4(W)	0.1	0.41	1.0	0.234	0.055	Whole	Bass
RuP1(F)	0.1	0.41	1.0	0.286	0.070	Fillet	Bluegill
RuP2(W)	0.1	0.41	1.0	0.233	0.053	Whole	Bluegill
RuP3(F)	0.1	0.41	1.0	0.502	0.107	Fillet	Bass
RuP4(W)	0.1	0.41	1.0	0.250	0.055	Whole	Bass

* Biological Technical Assistance Group

** Risk-Based Concentration Table, July-December 1995 by Roy L. Smith, PhD. Value represents the Risk-Based concentration of mercury (inorganic) in fish.

*** Food and Drug Administration

The RBC value can be compared to the concentration of mercury, dry weight. The bass fillet samples from the [REDACTED] and the [REDACTED] have exceeded the RBC value for fish indicating that there is a risk for human consumption of the bass from both ponds. The FDA Action Level can be compared to the concentration of mercury, wet weight. The FDA Action Level is not exceeded. The more conservative FDA Action Level of .5 mg/kg used for women of child-bearing years and children is also not exceeded. The BTAG value for considering an environmental risk is compared to the concentration of mercury, wet weight. The bass fillet samples from each pond exceeds this value. A threat to humans exist should the bass be consumed; an environmental threat may exist should an animal higher on the food chain consume the fish.

5.0 FUTURE ACTIONS/RECOMMENDATIONS

Future actions will be contingent on the RPM's direction. SATA recommends posting signs in the area informing people not to eat the fish. In reference to ecological or environmental risks, SATA recommends a more extensive biological assessment of the area if an assessment has not already been conducted. The assessment should include information on the animals in the area that could be affected by consuming contaminated fish. SATA further recommends contacting BTAG, EPA Toxicologists, Maryland Department of the Environment, and the Fish and Boat Commission for their individual recommendations.

6.0 PHOTOGRAPH LOG

SATA members photographed the 4 and 5 June sampling event. The photographs' numbers and descriptions are provided below. See Appendix A for photographs of the site along with dates.

Photograph	Description
1	SATA removing the spines from fish at [REDACTED]
2	SATA measuring the length of fish at [REDACTED]
3	SATA preparing to electroshock pond at the [REDACTED]
4	SATA electroshocking [REDACTED]
5	SATA electroshocking [REDACTED]
6	Electroshock equipment
7	[REDACTED]
8	SATA calibrating monitoring equipment at [REDACTED]
9	SATA preparing the seine at [REDACTED]
10	SATA deploying the seine at [REDACTED]
11	SATA deploying the seine at [REDACTED]
12	SATA pulling in seine at [REDACTED]

7.0 REFERENCES

SATA (Site Assessment Technical Assistance). 1995. Keystone Sanitation Landfill Site Sampling Plan from October 1995 Sampling Event. Delran, NJ.



AR320205

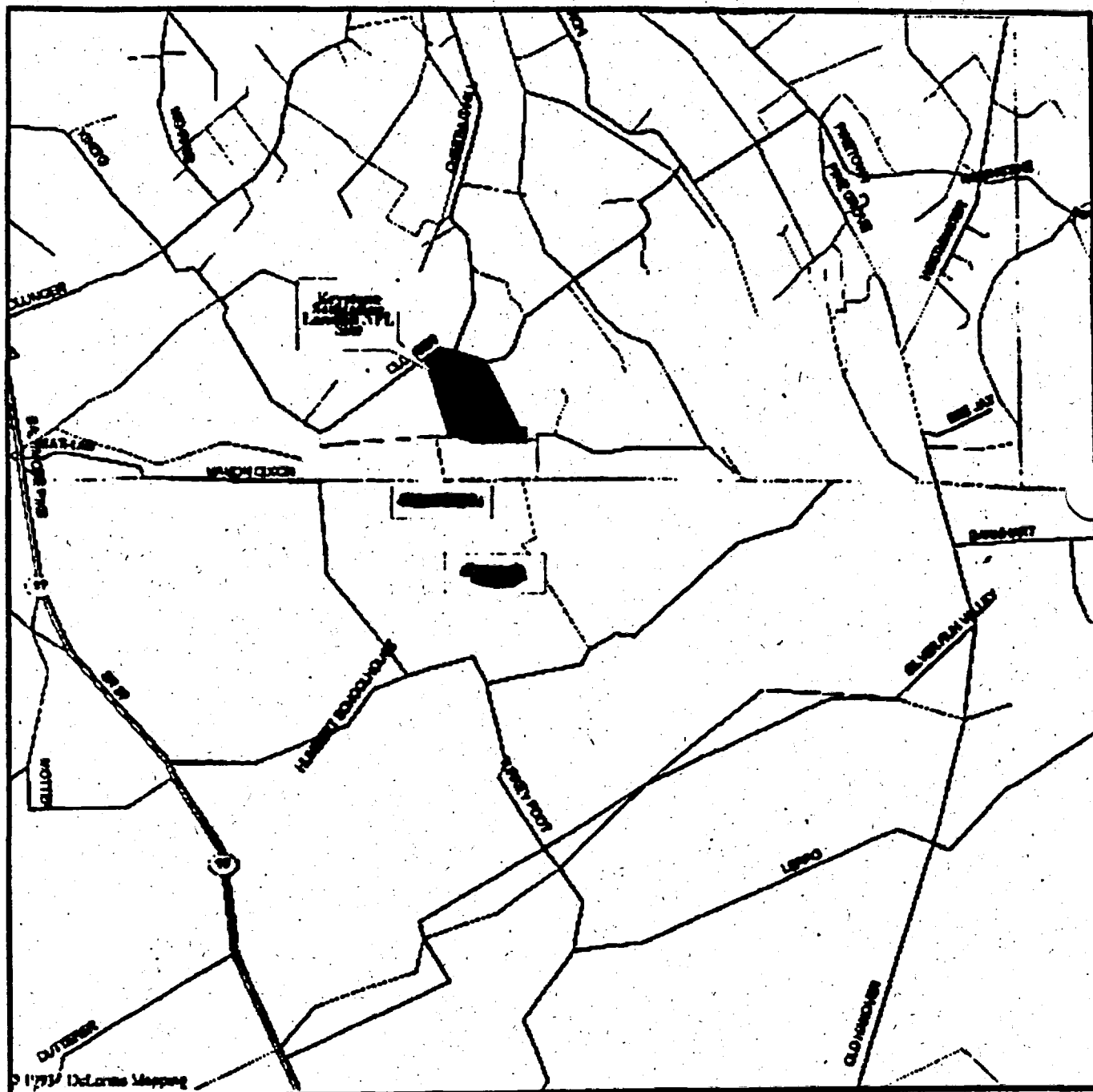


FEDERAL
PROGRAMS
DIVISION

Keystone Sanitation Landfill NPL Site
Hanover, Adams Co., PA

TDD #: 9605-23

PCS #: 24



Scale 1:31,250 (at center)

200 Feet

1000 Feet

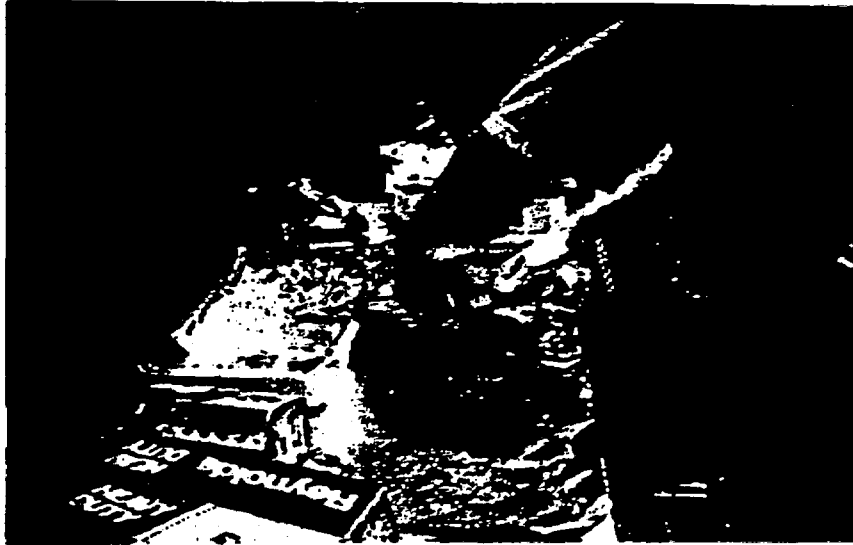
EPA10009



Figure 2: Sampling Location Map AR320208

Appendix A
Photograph Log

Photograph Log
Keystone Sanitation Landfill Site
Hanover, Adams County, Pennsylvania



Date: 4 June 1996

Photo 1 - SATA removing the spines from fish at [REDACTED]



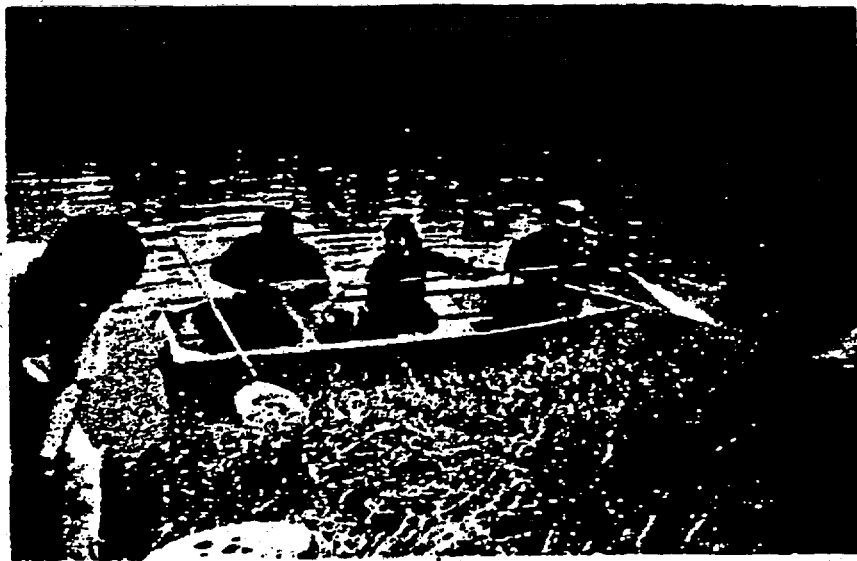
Date: 4 June 1996

Photo 2 - SATA measuring the length of fish at the [REDACTED]

AR320208

EPA10011

Photograph Log
Keystone Sanitation Landfill Site
Hanover, Adams County, Pennsylvania



Date: 4 June 1996

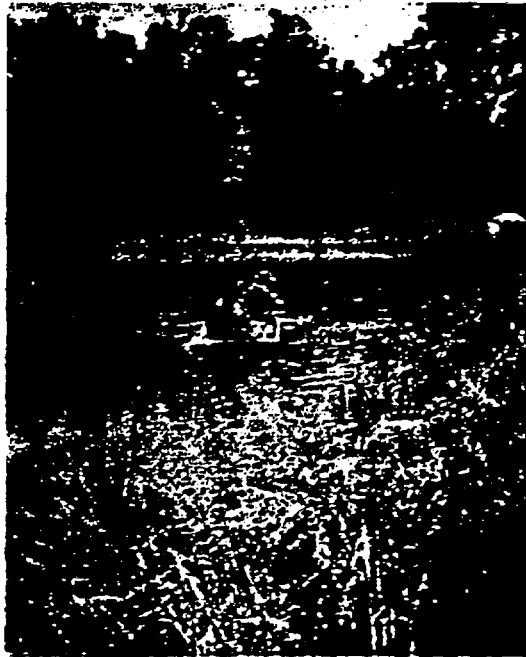
Photo 3 - SATA preparing to electroshock pond at the [REDACTED]



Date: 4 June 1996

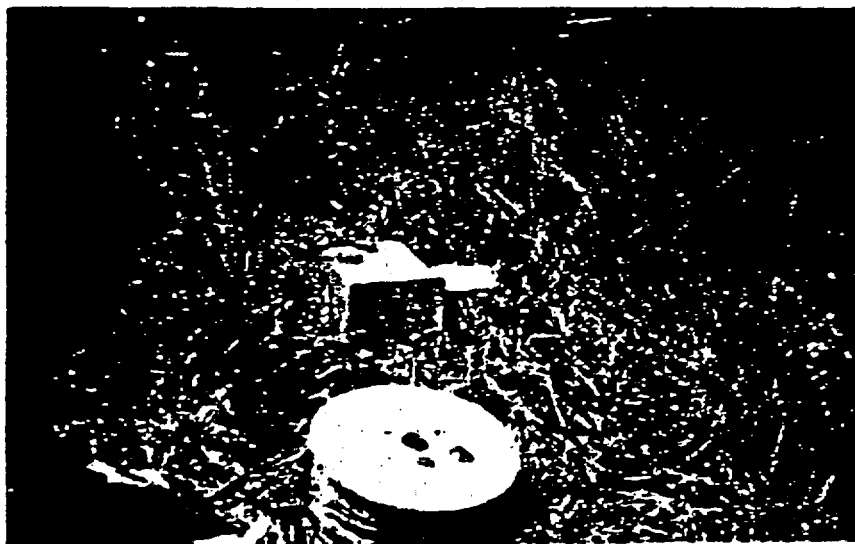
Photo 4 - SATA electroshocking [REDACTED]

Photograph Log
Keystone Sanitation Landfill Site
Hanover, Adams County, Pennsylvania



Date: 4 June 1996

Photo 5 - SATA electroshocking [REDACTED]



Date: 4 June 1996

Photo 6 - Electroshock equipment.

AR320210

EPA10013

Photograph Log
Keystone Sanitation Landfill Site
Hanover, Adams County, Pennsylvania



Date: 5 June 1996

Photo 7 - [REDACTED]



Date: 5 June 1996

Photo 8 - SATA calibrating monitoring equipment at [REDACTED]

AR320211

EPA10014

Photograph Log
Keystone Sanitation Landfill Site
Hanover, Adams County, Pennsylvania



Date: 5 June 1996

Photo 9 - SATA preparing the seine at [REDACTED]



Date: 5 June 1996

Photo 10 - SATA deploying seine at [REDACTED]

AR320212

EPA10015

Photograph Log
Keystone Sanitation Landfill Site
Hanover, Adams County, Pennsylvania



Date: 5 June 1996

Photo 11 - SATA deploying seine at [REDACTED]



Date: 5 June 1996

Photo 12 - SATA pulling in seine at [REDACTED]

AR320213

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